

PATENT
Attorney Docket No.: 50623.00067

AMENDMENTS TO THE CLAIMS:

- 1-39. (canceled)
40. (Previously presented) The method of Claim 60, further comprising roughening at least a region of the surface of the implantable medical device prior to applying the coating.
41. (Previously presented) The method of Claim 60, further comprising applying a primer on the surface of the implantable medical device prior to applying the coating.
42. (Previously presented) The method of Claim 41, wherein the primer is made of a material selected from a group consisting of ethylene vinyl alcohol copolymer, polycystine, polylysine, and reactive silanes, the reactive silanes comprising trimethoxysilane.
43. (Previously presented) The method of Claim 41, further comprising roughening at least a region of the surface of the implantable medical device prior to applying the primer.
44. (Previously presented) The method of Claim 41, further comprising heat-treating the coating.
45. (Previously presented) The method of Claim 41, wherein the primer contains at least one chlorosilane compound.
46. (Previously presented) The method of Claim 45, wherein the chlorosilane compound has a functional head.
47. (Previously presented) The method of Claim 46, wherein the functional head comprises an unsaturated group, an amino group, or a carboxyl group.

PATENT

Attorney Docket No.: 50623.00067

48. (Previously presented) The method of Claim 60, wherein the complex of heparin is DURAFLO an ionically bound heparin.
49. canceled.
50. (Previously presented) The method of Claim 62, wherein the adhesion enhancer is selected from a group consisting of poly(ethylene glycol), poly(ethylene oxide), poly(vinylpyrrolidone), poly(vinyl alcohol), poly(caprolactone), poly(glycolic acid), hyaluronic acid, polyurethanes, copolymers of caprolactone and glycolic acid, copolymers of caprolactone and ethylene glycol, segmented polyurethanes, and mixtures thereof.
51. (Previously presented) The method of Claim 62, wherein the coating is performed by dip coating or spraying.
52. (Previously presented) The method of Claim 62, further comprising roughening at least a region of the surface of the device prior to coating.
53. (Currently amended) A method of coating a stent, ~~the method~~ comprising:
- a) roughening at least a region of the surface of the stent; and
 - b) applying a coating to the stent, the coating containing a complex of heparin with an aromatic quaternary ammonium ion dispersed in a copolymer of ethylene with vinyl alcohol a polymer selected from ethylene vinyl alcohol copolymer, poly(ethylene glycol), poly(ethylene oxide), poly(vinylpyrrolidone), poly(vinyl alcohol), poly(caprolactone), poly(glycolic acid), hyaluronic acid, polyurethanes, copolymers of caprolactone and glycolic acid, copolymers of caprolactone and ethylene glycol, segmented polyurethanes, and mixtures thereof.
54. (Previously presented) The method of Claim 53, further comprising heat-treating the coating.

PATENT

Attorney Docket No.: 50623.00067

55. (Previously presented) The method of Claim 54, wherein the heat-treating is conducted within a temperature range of about 50°C to about 100°C.
56. (Previously presented) The method of Claim 53, wherein the roughening is performed by argon plasma etching.
57. (Previously presented) The method of Claim 53, further comprising applying a primer on the surface of the stent prior to applying the coating.
58. (Currently amended) A method of coating a stent, the method comprising:
- a) applying a coating to the stent, the coating containing a complex of heparin with an aromatic quaternary ammonium ion dispersed in a copolymer of ethylene with vinyl alcohol a polymer selected from ethylene vinyl alcohol copolymer, poly(ethylene glycol), poly(ethylene oxide), poly(vinylpyrrolidone), poly(vinyl alcohol), poly(caprolactone), poly(glycolic acid), hyaluronic acid, polyurethanes, copolymers of caprolactone and glycolic acid, copolymers of caprolactone and ethylene glycol, segmented polyurethanes, and mixtures thereof; and
 - b) heat-treating the coating.
59. (Previously presented) The method of Claim 58, wherein the heat-treating is conducted within a temperature range of about 50°C to about 100°C.
60. (Currently amended) A method of coating an implantable medical device wherein the method comprises applying a first coating to the device wherein the first coating:
- a) increases the biocompatibility and hemocompatibility of the blood-contacting surface;

PATENT

Attorney Docket No.: 50623.00067

- b) is adapted to deliver therapeutic amounts of therapeutic drugs into the blood;
- c) comprises ~~a polymeric~~ an adhesion enhancer; and
- d) comprises at least one of ~~the therapeutic drugs~~ drug wherein therapeutic ~~drugs~~ drug includes:
 - i) heparin and
 - ii) heparin derivatives, and

wherein the step of applying comprises providing a solution comprising at least one therapeutic drug and the adhesion enhancer.

- 61. (Previously presented) The method of Claim 60 wherein the implantable medical device is a stent.
- 62. (Currently amended) A method of coating an implantable medical device wherein the method comprises applying a coating to the device wherein the coating:
 - a) increases the biocompatibility and hemocompatibility of the blood-contacting surface and
 - b) is adapted to deliver therapeutic amounts of therapeutic drugs into the blood;
 - c) comprises at least one of ~~the therapeutic drugs~~ drug wherein therapeutic ~~drugs~~ drug includes:
 - i) heparin and
 - ii) heparin derivatives; and

PATENT
Attorney Docket No.: 50623.00067

iii) at least one adhesion enhancer, and

wherein the step of applying comprises providing a solution comprising at least one therapeutic drug and the adhesion enhancer.

63. (Previously presented) The method of Claim 60 further comprising applying at least one additional coating wherein the additional coating or coatings are the same as or different from the first coating and the additional coating(s)
- a) increase the biocompatibility and hemocompatibility of the blood-contacting surface;
 - b) are adapted to deliver therapeutic amounts of therapeutic drugs into the blood;
 - c) comprise a polymeric adhesion enhancer; and
 - d) comprise at least one of the therapeutic drugs wherein therapeutic drugs include:
 - i) heparin and
 - ii) heparin derivatives.
64. (Withdrawn) A method of coating a blood-contacting surface with a heparin-containing compound comprising:
- a) applying a first hemocompatible coating to the surface wherein the first hemocompatible coating is sufficiently tightly bonded to the surface so as to remain on the surface in contact with blood; and,
 - b) applying at least one second hemocompatible coating sequentially on the first hemocompatible coating wherein the at least one second hemocompatible coating comprises

PATENT
Attorney Docket No.: 50623.00067

- i) one or more therapeutic heparin-containing compounds releasable into blood; and
 - ii) an adhesion enhancer.
65. (Withdrawn) A method as in Claim 64 wherein the first hemocompatible layer includes a heparin-containing compound.
66. (Withdrawn) A method as in Claim 64 further comprising roughening the surface prior to coating.
67. (Withdrawn) A method as in Claim 64 further comprising applying a primer layer to the surface prior to applying the first hemocompatible coating, wherein the primer layer enhances adhesion of the first hemocompatible coating to the surface.
68. (Withdrawn) A method as in Claim 67 wherein the primer layer is selected from the group consisting of heparin-containing compounds, ethylene vinyl alcohol copolymer, polycystine, polylysine and reactive silanes including trimethoxysilanes.
69. (Withdrawn) A method as in Claim 67 wherein the primer layer contains at least one chlorosilane compound.
70. (Withdrawn) A method as in Claim 69 wherein the at least one chlorosilane has a functional head.
71. (Withdrawn) A method as in Claim 70 wherein the functional head of the at least one chlorosilane has functionality selected from the group consisting of unsaturated functionality, amine functionality, carboxyl functionality.

PATENT

Attorney Docket No.: 50623.00067

72. (Withdrawn) A method as in Claim 71 wherein the functionality is modified by polyethylene glycol or hyaluronic acid.
73. (Withdrawn) A method as in Claim 70 wherein the at least one second hemocompatible layer comprises a plurality of layers and wherein the plurality of layers have varying properties.
74. (Withdrawn) A method as in Claim 73 wherein the varying properties comprise varying compositions.
75. (Withdrawn) A material having a hemocompatible surface produced by the method of Claim 64.
76. (Withdrawn) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of the blood contacting surface is the material of Claim 75.
77. (Withdrawn) A medical device as in Claim 76 wherein the medical device is an endoluminal stent.
78. (Previously presented) A method of coating a blood-contacting surface with a heparin-containing compound comprising:
- a) providing a formulation containing at least one heparin-containing compound and at least one adhesion enhancer; and,
 - b) coating the surface with the formulation,
- wherein the formulation is adapted to deliver therapeutic amounts of heparin-containing compounds into the blood.
79. (Previously presented) A method as in Claim 78 wherein the at least one adhesion enhancer is selected from the group consisting of polyethylene glycol,

PATENT

Attorney Docket No.: 50623.00067

polyethylene oxide, polyvinylpyrrolidone, polyvinyl alcohol, polycaprolactone, polyglycolic acid, ethylene vinyl alcohol copolymer, hyaluronic acid, polyurethanes, copolymers of polycaprolactone and polyglycolic acid, copolymers of polycaprolactone and polyethylene glycol, segmented polyurethanes and mixtures thereof.

80. (Previously presented) A method as in Claim 79 wherein the coating is performed by dip coating.
81. (Previously presented) A method as in Claim 78 further comprising roughening the surface prior to coating.
82. (Withdrawn) A material having a hemocompatible surface produced by the method of Claim 78.
83. (Withdrawn) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of the blood contacting surface is the material of Claim 82.
84. (Withdrawn) A medical device as in Claim 83 wherein the medical device is an endoluminal stent.
85. (Previously presented) A method of coating a blood-contacting surface with a heparin-containing compound comprising:
- a) roughening the surface prior to coating; and,
 - b) coating the surface with a heparin-containing compound; and,
 - c) baking the surface and the coating thereon sufficient to affix the coating to the surface

PATENT

Attorney Docket No.: 50623.00067

wherein the coating is adapted to deliver therapeutic amounts of heparin-containing compounds into the blood.

86. (Previously presented) A method as in Claim 85 wherein the baking is at a temperature from approximately 50 degree C to approximately 100 degree C.
87. (Previously presented) A method as in Claim 85 wherein the coating is performed by dip coating.
88. (Previously presented) A method as in Claim 85 wherein the roughening is performed by argon plasma etching.
89. (Withdrawn) A material having a hemocompatible surface produced by the method of Claim 85.
90. (Withdrawn) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of the blood contacting surface is the material of Claim 89.
91. (Withdrawn) A medical device as in Claim 90 wherein the medical device is an endoluminal stent.
92. (Withdrawn) A heparin-containing composition for coating onto a blood-contacting surface comprising ethylene vinyl alcohol copolymer, at least one heparin complex, dimethyl sulfoxide and tetrahydrofuran.
93. (Withdrawn) A heparin-containing composition as in Claim 92 further comprising dimethyl acetamide.
94. (Withdrawn) A heparin-containing composition as in Claim 92 wherein the ethylene vinyl alcohol copolymer is about 2.2% by weight of the composition.

PATENT

Attorney Docket No.: 50623.00067

95. (Withdrawn) A heparin-containing composition as in Claim 94 wherein the heparin complex is from about 0.6% by weight to about 2.3% by weight of the composition.
96. (Withdrawn) A heparin-containing composition as in Claim 93 wherein the ethylene vinyl alcohol copolymer is about 2% by weight of the composition.
97. (Withdrawn) A heparin-containing composition as in Claim 94 wherein the heparin-complex is from about 1.1% by weight to about 2.0% by weight of the composition.
98. (Withdrawn) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of the blood contacting surface is coated with the material of Claim 92.
99. (Withdrawn) A medical device as in Claim 98 wherein the medical device is an endoluminal stent.
100. (New) A method of coating a stent wherein the method comprisesd
- a) applying a coating to the stent, the coating containing a complex of heparin with a quaternary ammonium ion dispersed in a polymer selected from ethylene vinyl alcohol copolymer, poly(ethylene glycol), poly(ethylene oxide), poly(vinylpyrrolidone), poly(vinyl alcohol), poly(caprolactone), poly(glycolic acid), hyaluronic acid, polyurethanes, copolymers of caprolactone and glycolic acid, copolymers of caprolactone and ethylene glycol, segmented polyurethanes, and mixtures thereof; and
 - b) heat-treating the coating,

PATENT

Attorney Docket No.: 50623.00067

wherein the quaternary ammonium ion has four R-groups, one is a 7-to-18-carbon-atom alkyl group and three are independently hydrogen, a 1-to-18-carbon-atom alkyl group, or a 7-to-18-carbon-atom aryl group.

101. (New) A method of coating a stent comprising applying a coating to the stent, the coating containing a complex of heparin with a quaternary ammonium ion dispersed in a polymer selected from ethylene vinyl alcohol copolymer, poly(ethylene glycol), poly(ethylene oxide), poly(vinylpyrrolidone), poly(vinyl alcohol), poly(caprolactone), poly(glycolic acid), hyaluronic acid, polyurethanes, copolymers of caprolactone and glycolic acid, copolymers of caprolactone and ethylene glycol, segmented polyurethanes, and mixtures thereof, and

wherein the quaternary ammonium ion is at least one of benzalkonium; cetylpyridinium; benzyl dimethyl stearyl ammonium; ions containing vinyl pyridines; ions containing vinyl pyridine and a benzyl group; ammonium ions containing a 7-18-carbon-atom aryl group; ammonium ions containing phenyl, benzyl, phenyl substituted with halogen, vinyl, or 1-4 carbon alkyl group, benzyl substituted with halogen, vinyl, or 1-4 carbon alkyl group; tridodecyl benzyl ammonium; benzyltrimethylammonium; p-chlorobenzyltrimethylammonium; benzyl-vinylbenzyl dimethylammonium; dibenzylmethyl-vinylbenzylammonium; tetraphenylammonium; dibenzyl dimethylammonium; butyl benzyl-trimethylammonium; tribenzylmethylammonium; and ions from toluidine blue, imidazole, pyridine, 3-amino-cinnoline, 2-amino thiazole, purine, 4-ureidosulphonylaniline, 2-ethoxycarbonyl aniline, 3-amino biphenyl, 2-amino-4,6-dimethylpteridine, 2-amino-6,7-dimethylpteridine, 2-aminoquinoxaline, 2,3-diaminoquinoxaline, triazole, 2-amino pyrimidine, 5-amino-4-methyl pyridine, 1-phenyl pyrrolidine, methylindanyl amino indane, N-methyl-1,4-benzoquinone imine, 1,4-benzoquinone imine, N-benzyl-1,4-benzoquinone imine, Thioflavine T, N-methyl cytidine, biliverdine, and Rhodamine B.